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Tech Forum

**Strategic Choice of Professional
Telecom Services in the Post-PC Era**

ZTE TECHNOLOGIES

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A technical magazine that keeps up with the latest industry trends, communicates leading technologies and solutions, and shares stories of our customer success

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Source: China Daily

ZTE USA Partners NBA's Rockets for 2013/2014



5 October 2013, Houston — The Houston Rockets and ZTE USA jointly announced their first partnership, making ZTE the official smartphone of the Houston Rockets for the 2013-14 NBA season. The partnership is the first of its kind for ZTE globally and the first big consumer marketing push in the U.S. since the company entered the States 15 years ago.

As part of the partnership, ZTE will have an opportunity to engage directly with the fans of the Rockets around the world through a variety of avenues, including key Rockets events, television and digital exposure.

Both the Rockets and ZTE brands are debuting new, more powerful lineups this year. ZTE is launching two new smartphones—the ZTE Grand S and the ZTE nubia 5—while the Rockets have a highly anticipated new roster featuring James Harden, Dwight Howard, Jeremy Lin and Chandler Parsons.

ZTE Wins Contract for 3rd Phase of ANTEL GPON Expansion

23 October 2013, Shenzhen — ZTE announced it has won a contract for the third phase of a GPON capacity expansion contract with Uruguay's Administración Nacional de Telecomunicaciones (ANTEL).

ANTEL has a 97 percent share in Uruguay's fixed voice and broadband market and is the largest fixed network operator in the country. It also provides mobile communications services. In 2010, ANTEL began using the state-of-the-art GPON technology to deploy a national FTTH network. ZTE has provided GPON products and services to ANTEL for three

consecutive years.

As part of the project ZTE will provide a ZXA10 C300 optical access platform to ANTEL. This platform is a futureproof, converged full-service platform that fully meets ANTEL's current demands for broadband services. It also supports smooth upgrades to NG PON and WDM PON in the future. Over the past two years, ZTE has helped ANTEL complete the construction of a 120 Mbps high-speed broadband network. The network provides FTTH-based VoIP, HIS, and IPTV services to 540,000 households.

ZTE Provides Turnkey Project for Jazztel National Broadband FTTH Network in Spain

22 October 2013, Shenzhen — ZTE and Jazztel, an IBEX 35 company and leading telecommunication service provider with its own network in Spain, have announced that Jazztel's national high-speed broadband fibre to the home (FTTH) network deployment is progressing satisfactorily and has begun commercial operation.

The FTTH framework agreement, signed between ZTE and Jazztel in November 2012, plans to build a broadband network within two years that would cover three million home and

corporate users and bring in a new era for Spain's broadband market.

ZTE provided Jazztel with an end-to-end turnkey solution that includes a full range of services including equipment, engineering and maintenance. To make the FTTH network future-proof and scalable, ZTE offered a next-generation, integrated full-service optical access platform, the ZXA10 C300. This allows for smooth evolution to next generation passive optical networks (NG PON) and wavelength division multiplexing (WDM) PON technology.



ZTE Nine-Month Net Profit Rises **132%** as Operations Strengthen

22 October 2013, Shenzhen — ZTE reported nine-month net profit increased 132% from a year earlier, as the company executed its operational strategy to improve cash flow and raise profitability.

Net profit attributable to shareholders was RMB 552 million from January to September, with basic earnings per share of RMB 0.16, in line with the company's earlier forecast. Revenue dropped 10% to RMB 54.66 billion. ZTE posted a quarterly profit after extraordinary items in the July-September period, ending a negative sequence that began in the second-quarter of 2012. ZTE forecasts the company will post a full-year net profit in 2013, after a loss in 2012.

ZTE exercised stringent control

over selling, general and administrative expenses, resulting in strong improvement in cash flow in the third-quarter. The positive operational cash flow reported in the third quarter followed a sequence of negative cash flow in the July-September periods in 2009 to 2012.

During the reporting period, capital investment by operators in the global telecommunications industry remained sluggish, with spending focused on 4G networks and the construction of broadband networks, and their ancillary transmission networks. There was also progress in the development of emerging sectors such as cloud computing and the internet of things.

ZTE and China Telecom Set World Record in Real-Time Terabit Optical Transmission

28 October 2013, Shenzhen — ZTE announced that it has set a world record in real-time terabit optical transmission in collaboration with China Telecom.

Deploying a terabit WDM real-time transmission system based on ZTE's ZXONE 8700 platform, ZTE and China Telecom completed real-time data transmission over a distance of 3,200 km on G.652 optical fiber without Raman amplification that was error-free for 24 hours, achieving a world record.



ZTE Contributed to the Launch of 4G Network of BASE Company in Belgium

4 November 2013, Shenzhen — ZTE and BASE Company, the Belgian subsidiary of Dutch mobile operator KPN, have launched BASE Company's 4G services in Belgium.

BASE Company has launched 4G services directly in 15 cities and become the second operator to start 4G in Belgium. During the press conference at the announcement in early October, a 4G smart phone with only two signal bars reached download speeds of up to 42 Mbps, and multimedia files played clearly and smoothly.

ZTE helped BASE Company construct high-quality UMTS and HSPA dual-carrier networks in Belgium. With a Uni-RAN solution that supports smooth evolution and good equipment performance, ZTE has been selected as a 4G radio equipment supplier for BASE Company.

"Rolling out 4G as second operator in Belgium is important to meet new needs of our customers. In recent years, we've seen the number of smartphones and data usage on these devices skyrocket. Customers use their mobile phones for much more than just calling and sending text messages, and that evolution is continuing. As a challenger on the mobile market, we always want to give our customers the ultimate user experience," said Jos Donvil, CEO of BASE Company.

Telenor:

Making a Difference in Pakistan

Reporters: Liu Yang and Zhao Rujing

Norway-based Telenor group is one of the leading mobile operators in the world and has mobile operations in 12 countries across Europe and Asia. Telenor came to Pakistan in 2005, when telecom was booming in the country. The company quickly grew into the second-largest mobile operator in Pakistan. To secure its leading position, Telenor Pakistan is modernizing its network to introduce 3G

services and prepare for the 4G era. This project is being undertaken with ZTE and is the first of its kind in Pakistan. It is the most comprehensive network swapover in all of the Telenor Group. Lars Christian, Telenor Pakistan CEO, and Gyorgy Koller, Telenor Pakistan CTO shared with us how Telenor Pakistan has climbed from No. 5 to No. 2 in Pakistan and the challenges of operating in this fast-growing country.

Q: Telenor is the largest foreign investor in Pakistan. What are the

differences between Norway and Pakistan in terms of culture and markets?

Lars Christian: There are between Pakistan and Norway many differences. First of all, the population in Pakistan is about 40 times greater than that in Norway. The Norwegian market is probably one of the most advanced in terms of both mobile technology and customer services. How we distribute our services is very different. In Pakistan, every distribution is done through a physical shop—we have 200,000 outlets. In Norway, most distribution is done electronically over the internet.

Second, running a network in Norway has its challenges, but most of the time



Lars Christian (L) Telenor Pakistan CEO, and Gyorgy Koller (R), Telenor Pakistan CTO

there is power. In Pakistan, we have no power 15 or 16 hours a day. This is, of course, is a very different challenge from a power-management perspective.

Also, Pakistan benefits from us learning from more modern markets, like Europe. Europe is five to seven years ahead of Pakistan when it comes to services offered. We can learn from Europe, or even Thailand or Malaysia, and implement things much faster in Pakistan. We can apply experiences in those markets to Pakistan without having to reinvent the wheel every time.

Q: What best practice have you applied in Pakistan?

Lars Christian: First of all, when Telenor goes into a new country, we don't only seek to maximize profit for our teleco. We want to make a difference to the country. We want to contribute to the development of the country.

Telenor came in as No. 5, and instead of putting our main efforts into the cities, we went into the rural areas, where few of us were. So, in a way, we helped development of the rural areas.

Second, we have also launched financial services. Very few people in Pakistan have access to bank services, and we want to extend access to these services. We have contributed to Pakistan's society with branchless banking. Our company culture has attracted the best talents in Pakistan so that we stand out from the competition. Now we are No.2 and quickly catching up with the No. 1 in the industry.

Q: As the fifth entrant into an already competitive market, how

did you become the number two operator in Pakistan?

Gyorgy Koller: Definitely by echoing the market but also branching out into other areas. We also have a very strong distribution model.

I would say our success can also be attributed to the people we have working for the company. We are considered the best employer in the country in the telecommunication industry and second best across all industries. So people love to work for Telenor Pakistan.

We roll out the network, which grows to a sixth billion dollar market. Telenor has much experience of fast, efficient network rollouts in Pakistan.

So it's a combination of many factors that has allowed us to rapidly gain a large market share in Pakistan.

Lars Christian: Also, going forward,

■ VIP Voices

Telenor has launched a program called “Internet for All.” We want the whole of Pakistan to start using the internet, and we know that, internationally, if we increase internet penetration by 10%, GDP increases 1%. We have partnered with ZTE for the network swapover, which is almost completed. We are in a very good position to lead internet development in Pakistan. We will continue cooperating with ZTE, and I think together we will win.

Q: What are the biggest benefits that Telenor brings to Pakistan?

Lars Christian: We increased competition in the marketplace, so prices halved. We also increased the footprint of mobile telephony in the market. Before we came, telecommunications was only in big cities, and now it's all over the country. We are a major contributor to that. We also brought financial services to the underprivileged. We have launched branchless banking, and we have been an important driver of Internet for All. It's still early days for the internet in Pakistan, but we will play an important role in bringing it to the masses.

Q: Telenor Pakistan announced its national network upgrade and extension project in 2012. What is the background of this project?

Gyorgy Koller: We have three drivers of this modernization. We wanted to have a future-proof network that was not only 2G but also 3G and 4G.



The second driver was lower power consumption. Power is a key challenge in Pakistan. Having mechanisms that consume much less power was important.

The third driver was the network elements on our network. Many network elements had reached end of their life, so we wanted to have a new network.

With this network modernization, we will evolve to future architecture. Telenor Pakistan's network will be the only all-IP network in Pakistan. Each of the network elements, from base station to switches and core network, will be IP-based. 3G is going to happen in Pakistan, and they are going to be very aggressive before Internet for All. Then, our network will give full support. These are the reasons we decided to modernize our network.

Q: What will be the biggest

challenges in this largest undertaking ever by Telenor?

Gyorgy Koller: The biggest challenge is that we need to swap a live network. In Pakistan, the network is serving 32 million subscribers. We need to compete each day against the other operators. You cannot allow service to slip while you are swapping over the network. That has been a huge challenge.

In addition, Pakistan has very challenging environment because of unreliable power, security, and accessibility in rural areas. It's difficult to go to sites at night because they are far away, and there are many areas that you should not go after sunset.

Despite these challenges, they say that they will finish the project as we planned at the beginning. This is a very unique situation, not only within Telenor Group but also for other big



An interview

operators. We signed the contract with ZTE, and ZTE has proceeded according to the agreed timeline. Swapping over everything in the network is a massive job, but we have managed to keep the timeline. That has been a very important achievement.

Q: What do you think of ZTE's project team?

Gyorgy Koller: ZTE is doing a great job. Of course, ZTE went through a learning curve. In the beginning, ZTE struggled a little bit to get contractors and subcontractors. However, they managed to iron out their issues and even increased the number of sites they were swapping over in a month. During July, they swapped over 974 sites in a month, which is very fast. Of course, ZTE still has challenges with subcontractors and with the quality, but

despite these challenges, we are very proud to see that we are finishing this swap as planned.

Lars Christian: I think one of the reasons for our big success was that we didn't have separate ZTE and Telenor project teams. We only had a joint team, and that's one of the main reasons we were so successful.

Gyorgy Koller: They had the same goals and worked together. That was key to the success.

Q: What are your thoughts on the future trends in the Pakistan telecom market?

Lars Christian: In the wireless market, Telenor Pakistan has a great future because there is very little existing infrastructure for communications. You know fixed in Norway seems to go straight to wireless technology. Most Pakistanis will have their first internet experience on a wireless technology. I see no reason why Telenor Pakistan should not catch up with the rest of the world. They are having issues with 3G, but when the ball starts rolling, I think it's going to roll fast. I believe Pakistan

*We didn't have separate ZTE and Telenor project teams. We only had **a joint team**, and that's one of the main reasons we were so successful.*

will catch up with the rest of the world. They have a huge base of very talented software developers and a strong IT environment. When you combine this with wireless technology and all the new features that they devise, I think that Pakistan can benefit a lot.

China is a good example of how it is possible. 25 years ago, people didn't talk about Chinese companies such as ZTE and Huawei seriously. But think that projects like ours are proof that it's possible to catch up if we really do a good job.

Q: What are your expectations for Telenor's development in Pakistan?

Lars Christian: We will own the ADSL in Pakistan. We are about to build a new headquarters in Pakistan. For the next three years, we want to be the biggest retail bank and the biggest internet provider in Pakistan. We want to have more than 30% market share and have more valuable customers in our network. In the long run, we will expand into more vertical categories than purely telecom. We will go first into areas that benefit Pakistan, not only ourselves. **ZTE TECHNOLOGIES**

DiGi:

The Smart Choice

Reporter: Low Sze Sze

DiGi.Com Berhad (DiGi) is listed on the Bursa Malaysia stock exchange and is part of the Telenor telecommunications group. In 1995, DiGi commenced operations by launching fully digital GSM 1800 services. At the time, these were the first digital mobile services in Malaysia. DiGi has continued to be the foremost provider of innovative telecommunication services and is committed to connecting all customers in Malaysia to reliable, high-speed internet. DiGi also seeks to build a business that is financially sustainable and environmentally responsible.

Ole Martin Gunhildsbu has been chief technology officer at DiGi since January 2008. He has much experience in various technology management positions in the telecommunications and IT industries. He talked about DiGi's challenges, business strategy, and collaboration with ZTE.

Q: What is DiGi's market position in Malaysia?

A: I think DiGi is very well positioned

in the mobile market in Malaysia. We started on a small scale and encountered several challenges when Telenor Group took DiGi over. Now DiGi ranks third in Malaysia and is not far behind Celcom and Maxis. In certain segments, DiGi is almost the leader. In Malaysia, there are three big operators, each of which has differences in terms of revenue and customer market share. DiGi has secured about 37% of the mobile market.

Q: Over the past two years, DiGi has promoted its mobile service packages at the youth market rather than the corporate market. How will the youth market contribute to the overall growth of DiGi?

A: Yes, DiGi has targeted the youth market in its business strategy. We are known for providing affordable offers, and we want to maintain that reputation while moving strong into the youth market and data market. However, broadly speaking, we have all kinds of internet services that we wish to extend





to as many users as possible throughout Malaysia. The youth market is an interesting place to start.

Q: How is your network modernization progressing?

A: Telenor Group has been strategically modernizing its network, and in several markets we have used a single vendor. Of course, you are kind of stuck with a single vendor if anything goes wrong, but there are also many opportunities to create synergies with a single vendor. For example, we know the end-to-end progress of the project and can build a strong long-term partnership.

With ZTE, we can see the end of network modernization. It has been struggle for DiGi and ZTE, but we are seeing the ends of network modernization. We still have lots to do in this market, and we are still a little bit behind Celcom and Maxis when it comes to 3G coverage. LTE is also going to be very important in our future.

Q: Will DiGi stick with a single-vendor strategy?



DiGi CTO Ole Martin Gunhildsbu (R) and the reporter Low Sze Sze (L)

A: No. We won't limit ourselves to a single vendor but nor will we rule out the idea either. If we can establish a good partnership and get good deals, we will consider it. Many other companies do not enter into single-vendor arrangements, but we may again in the future. I think our approach is more pragmatic. It's impossible to have a single-vendor strategy if you are a standalone business; you can only do it if you are a group. If a vendor does not deliver in our market, they are often considered by other business units in the group.

Q: Are there any restrictions or controls (e.g. cyberspace security) by MCMC that present

a challenge to DiGi offering good customer plans?

A: Cyber security doesn't necessarily present a challenge in this way, but one of the main challenges is providing the best possible solutions to our customers. This means we must provide the best, most secure products and also provide wide coverage. Our customers are also concerned that their data is safe with us. Ensuring the customer comes first is definitely our main objective.

Q: What challenges did you encounter working with ZTE?

A: We had to change every one of DiGi's portable networks, and certain technologies were not ZTE technologies. Currently, 85% of the networks have been transferred to ZTE technology. I think the major challenge was not to affect customer experience during the swapover. When things go wrong, the customer is immediately affected.

Q: Is MCMC monitoring quality of service?

A: Not only MCMC; I think customers are more and more concerned about QoS and take it much more seriously than they used to. They expect more from the operator, and we need to accept that the customer comes first. We want to ensure that our services improve each year. I'm working towards modernizing our whole network so that DiGi is much more

competitive moving forward into the data age.

Q: Telenor has launched 4G services. Has Telenor shared its 4G experiences with DiGi?

A: Over the past several years, we have been rolling out LTE services in certain Nordic countries. We have a very strong market and technical community within the Telenor group, and we all exchange experiences. We make sure all our people are moving across different countries to leverage experiences.

Q: What's your opinion of ZTE contribution to DiGi as a single vendor for D'Nemo project? What do you think about the skills and competencies of ZTE staff?

A: I think ZTE products are definitely competitive, but ZTE still needs to improve in terms of project planning, management, and rollout.

There have been some challenges in the relationship between DiGi and ZTE, and we have also changed the way we are working a little. Some of the things that ZTE were supposed to be responsible now fall back to DiGi. We have found a better way to work together, and the project is progressing quite smoothly. ZTE has only been in the international market for a few years, and even though it is catching up fast, there is a lot of ground to cover. I think ZTE knows its shortcomings very well and knows where it needs to improve. If ZTE is able to really study and learn from different projects—not only those

it has undertaken in Malaysia but also in Hungary and Pakistan—I think ZTE's future will be bright.

Q: Considering market competition and uncertain economic growth in Malaysia, would DiGi collaborate with ZTE again?

A: Sure. However, ZTE must first prove it can step up gradually in terms of its service competencies and areas of service. Regardless of some of the criticisms I have of ZTE, I still think there are good prospects for collaboration between ZTE and DiGi.

Q: Are Malaysian employees becoming more expensive? Is this a reason DiGi seeks foreign expertise?

A: At the moment, I don't think local labor costs are really an issue for us. Compared with European operators, we have high operation costs but manageable labor costs. Our strategy is not to do simple, repetitive stuff, such as maintenance that the vendor could do. We believe the vendor has skills and competencies that we don't have. For example, we have a vendor that delivers services to more than one operator in Malaysia, and this vendor has skills that we don't have. So we are trying to strike a balance between providing operator services and outsourcing managed services to vendors. DiGi will continue to work with vendors that have particular skills and competencies that we require at the time. **ZTE TECHNOLOGIES**

Li Zheng, director of service development strategy of ZTE Corporation



Strategic Choice of Professional Telecom Services in the Post-PC Era

By Li Zheng

In April 2013, two news events drew attention to the topic of over-the-top (OTT) providers. One was the Boston Marathon bombings in the US. Shortly after the event, posts and photos flooded Twitter, Reddit, and other social media. The other was news about WeChat's charging practices in China. This stirred up quite a buzz in the online community and pushed the conflict between OTT providers and telecom operators into the spotlight.

The lightning online response to the first major terrorist attack in the US in the

age of social networks foreshadows an era where new media completely takes over mainstream print media and radio in covering an event. A report from the Pew Research Center released on April 23 (one week after the bombings) showed that up to 56% of the American people aged 18 to 29 had learned about the event on social media. In China, the WeChat incident shows how emerging media are nibbling away at the core services, such as SMS, of traditional operators. At the same time, small-data, long-online communications are creating unprecedented signaling storms for operators.

These two seemingly unrelated events show two key trends in

communications: wireless access and mobile devices. The method of consuming information is also changing. We are entering a post-PC era, and the whole telecom ecosystem is being reshaped. According to OVUM, the annual revenue of the telecom service market is US\$84.8 billion (2011), and telecom operators are facing tough challenges in their attempts to create or capture new opportunities. In this new environment, operators need to take customer trends and demands very seriously.

New Leaders in the Telecom Ecosystem

The world of mobile internet is



complicated: The telecom subscriber market is almost saturated, and the main businesses that operators rely on for revenue are slowing year by year. On the contrary, OTT businesses are booming and demanding constant network expansion. As a result, there is a growing mismatch between investment and income. When an industry is mature and finds itself in such a dilemma, dramatic changes are on the horizon.

In 2012, OVUM published a report on the state of the telecoms industry in 2020. The report was based on a series of prior reports beginning in 2009. OVUM predicted that new players would enter the traditional telecoms ecosystem and influence technology, services, channels, and customer behavior and expectations. Operators would no longer be at the center of the telecommunications universe, where their only threat came from other operators. In the current environment, telcos no longer receive the

majority of revenue from transactions made over their networks.

In 2013, Wei Leping, director of the Science and Technology Committee of China Telecom, gave a speech called “De-Telecom,” in which he concluded that future telecom operators will completely or partly return to playing the role of public service provider and will achieve meager profits and low growth. His comments triggered an online firestorm.

OVUM predicts that there will only be a small number of SMART (services, management, applications, relationships, and technology) players in the telecom ecosystem by 2020, and that fewer of these will be telcos. Apple, Google, and Amazon are SMART companies, and among the traditional telcos, only BT Global Services and Verizon Business have aspirations to be SMART businesses. The remaining telcos will become LEAN (low-cost enablers of agnostic networks) operators. They will run open, low-cost, technology-agnostic networks that provide network capabilities to a wholesale customer base.

In the future, LEAN operators will resort to continuous acquisition and integration to achieve considerable scale, which will then translate into cost advantages and bargaining power. LEAN operators will provide high-quality telecom services to business customers and, at the same time, attract investors seeking low risk and low returns. Lower OAM cost and higher management efficiency will become top priorities for LEAN operators. They will continuously outsource network-related businesses, including network

infrastructure construction and network OAM. Equipment providers with global network operations centers, outstanding resource integration capabilities, and core technologies will be in a dominating position in the future telecom market. At present, vendors are also being tested in their ability to transition towards service provision. Only those that maximize their efficiency through better management, processes, and technology can possibly come out on top in this winner-takes-all battle.

LEAN operators will demand network infrastructure services, but SMART operators cannot be ignored. SMART operators will provide packaged end-to-end connection services, superior communication services, and abundant mobile applications to end users. Professional services providers will need to improve their service quality through smart pipes, swiftly restore interrupted services, and guarantee the ultimate customer experience. To ensure services are not adversely affected by network technologies, more sophisticated planning and optimization needs to be done in very complex heterogeneous network environments.

New Demand on the Value Chain of Telecom Services

In the post-PC era, many desktop user behaviors are being seen in mobile internet, and these behaviors will likely significantly impact the telecom ecosystem. WeChat, for example, is an instant communication app that builds its communication mechanism above the layer 3 TCP/IP of the traditional communication network protocol.

*Core business is migrating from the bottom layer up, and the focus of **professional services** should also be redirected from the network to the customer.*

People find it more convenient to chat with friends using WeChat on their mobile phones. Desktop chatting has therefore evolved into a small-data, long-online mobile chatting. Because of limited radio spectrum and the energy-saving modes of handsets, a network is prone to releasing established data links of handsets that are idle. However, this is often undesired by the end user and contrary to the customer experience that the OTT is trying to create. This is why OTTs have adopted a strategy of keeping a link alive for a super-short period. Unfortunately, this causes a signaling storm because invalid requests consume signaling resources. It also gives rise to poor overall user experience because many network resources are occupied.

End-to-end services have become so complicated that they require more than one NE for delivery. This is why the WeChat issue and other similar issues cannot be sufficiently dealt with by network software and/or hardware upgrade. Professional telecom service teams that are familiar with network elements, technologies, and vendors should be established to deal with network issues case by case. A traditional network-centered service ideology no longer fit in with changing demands in the mobile broadband age. For example, in order to centrally manage all push notifications, Apple

introduced Apple push notification service (APNS). This reduces the impact of signaling on the network created by iOS applications. Core business is migrating from the bottom layer up, and the focus of professional services should also be redirected from the network to the customer. This explains why manufacturers have recruited specialists in terminals and app development into their professional service teams. In this way, IT-based mobile internet applications can have both interconnection and mobility. Not only will operators be better served, but OTTs and all other players in the telecom ecosystem will be better served and share professional knowledge and skills.

The conflict that has been triggered by WeChat and others basically derives from the inherent differences between traditional communication technology and IT. To provide better information services for consumers, a suitable catalyst is needed to reshape capabilities. Telecom equipment providers are well positioned to be that catalyst because of their advantages in providing technology and services and because of their neutrality in the telecom value chain. Since 2010, ZTE has included important mobile internet services, such as Tencent QQ, Sina Weibo

and Tencent WeChat, as key service modules in its UniCare professional service. ZTE has much experience in optimizing app-related services in networks around the world. At the 3GPP-R12 conference in 2013, ZTE proposed modifying the bottom-layer protocol to accommodate small-data, long-online services typically used in mobile internet. The proposal was accepted unanimously, and ZTE was called to lead this modification work.

Conclusion

Professional telecom services are becoming increasingly important in the overseas telecom value chain. In China, the situation is a little less rosy in terms of sharing technology, experiences, and knowledge.

However, China has included telecom services in its tax reforms, and some sales tax items will have VAT only. This means operators will be more willing to outsource parts of their service businesses. Only when the telecom industry is fully oriented towards the needs of the market can it become highly efficient and eliminate waste through service specialization. As professional telecom services boom, Chinese operators are catching up with their overseas counterparts by innovating with telecom technology and improving productivity of telecom-related labor. **ZTE TECHNOLOGIES**

Muhammad Salman Sami Khan, *senior BSS/OSS technical manager of ZTESoft*



Building the Business Case for Big Data Analytics

By Muhammad Salman Sami Khan

The amount of data being transported, stored, and processed is growing exponentially. Raw data has very limited value, but when it is analyzed and turned into information, it becomes valuable. Digital service providers, such as Amazon and Google, are leading the way in understanding how to make raw data valuable, and many others are playing catch-up. New tools and techniques are being developed all the time to make this task easier.

Data analytics provides significant insight into customer satisfaction so that

customer needs and behaviors can be better understood, and new sources of revenue can be identified. It improves customer satisfaction by identifying where customers are experiencing problems with a service or website; it helps prevent fraud and minimizes risk; and it offers the potential of monetizing from third parties.

ZTE is well-known for providing multiple solutions and is vocal in making the business case for big-data analysis. ZTE understands the concept of big data and provides support for

- identifying the particular business

case for big-data analysis

- estimating the start-up investment
- creating a data-centric culture and determining how it will affect people, processes and systems
- identifying the use cases for data analytics and where it will most add value
- commodifying the data, i.e. aggregating, packing and selling customer insight

When communication service providers (CSPs) think of big data, they first think about the network and the challenge of managing it. However, big data isn't just about CSP network management; it is an opportunity for an operator to redefine how they interact with customers and partners and how they interact internally. This means that we need to redefine big data.

What is Big Data?

People have many different opinions about big data, and it has been defined in many different ways. However, most agree that it has three main characteristics: volume, velocity, and variety. A recently published Gartner report offers the following definition: Big data is high-volume, high-velocity, and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making. The veracity of the data and the value of customers as the source of the data are also of utmost importance to CSPs.

CSPs have been managing, safeguarding, and storing their big data. However, the opportunities lie

in putting this data in the hands of people who can analyze it in order to make better-informed decisions. Days-old data summarized and stored in a warehouse may be useful for managed reporting of routine information, but it is not suitable for fast-changing, unanticipated management information needs.

The new paradigm in analytics infrastructure is real-time visual discovery of large amounts of data. This allows a business to find critical information in a timely manner.

Business Case and Initial Investment

There is no singular method for providing a business intelligence solution to meet a company's unique needs. However, there is an approach to taking advantage of big data that minimizes risk and increases the likelihood of success:

- begin with stakeholders. Categorize stakeholders by role, prioritize them in terms of information-making value and follow a step-by-step road map.
- consider culture. Good decision making requires a cultural shift towards data-driven, fact-based decisions (as opposed to unsupported or intuitive decisions). Business leaders need to emphasize quantitative approaches to optimizing business performance.
- find data stewards. Finding the right people to define data governance and implement data management processes can be tough. Complex analytics have traditionally been relegated to statisticians, analysts,

data scientists, or other highly cerebral people. However, such roles are not part of the organizational charts of most companies, and integrating these roles with business management roles to solve problems can be a challenge. A new breed of data steward has a mix of technical and business skills and may be a single person or a member of a tightly aligned team.

- set clear goals. Big data projects are difficult, so don't try to boil the ocean. Instead, start small, show a win, and grow incrementally. Decisions informed by big data should be catalogued as use cases. The impact of each decision should be weighted, and goals should be driven by these use cases. The entire information management landscape should be scoped, but only pick the low-hanging fruit. Goals aren't achievable unless they are smart, measurable, actionable, realistic, and time-bound (SMART).
- create a plan. When developing a plan, the goals need to be linked to volume, velocity and variety. Big data is a complement (not replaces) existing analytics, such as data warehouses, OLAP, and decision support systems (DSS). Of course, no plan is complete without ROI projection, but don't try to create an overarching "big data ROI" forecast. Instead, develop ROI forecasts by each use case.
- establish metrics. There are many criteria for assessing the impact of a decision. These might include reduced risk, increased confidence, or

quality of decision. However, I prefer to assess the impact of a decision in terms of financial metrics, either in the form of cost avoidance or incremental revenue.

- deploy technology. By definition, big data is information that cannot be leveraged using traditional processes and tools, but it has the potential to resolve many common challenges. A technological starting point is the open-source big-data engine called Hadoop. This is particularly well suited for loosely structured or unstructured data as well as high-volume search and discovery.
- make big data small. This means delivering small data in context (with business use cases) to decision-makers. In this way, insights are easily consumed and actionable. This is the last mile in making big data useful.
- design for continuous process improvement (CPI). Making better business decisions is not a onetime activity. Incorporating a CPI methodology into a plan allows for learning, improved performance, and increased ROI over time.

Big data is often considered as a sea, which means there is unlimited data and thus there can be a lot of satisfactory factors in order to manipulate this data. If the satisfactory factors are given in hands of end users, big data has a never ending scope and more healthy investment is required. If big data organizations keep themselves on the driving seat to guide vend users, the investment becomes much smaller and simpler with minimum risks.



Use Cases for Data Analytics

Sometimes use cases can drive points home. In reality, big-data use cases are as varied as big data itself. Big-data analytics provide new ways for business and governments to discover new business facts that no one knew before. Big-data analytics has been used for

- determining customer experience, including customer satisfaction and

360 degree customer view

- predictive analysis
- marketing according to customer behavior
- electronic sales management, including all the factor of social media
- finance
- fraud detection
- analyzing product usage
- inventory analysis
- customer service management.

Big Data Could Become Big Business for Telcos: Aggregating, Packing and Selling Customer Insight

Mobile operators know a lot about their customers. They know which cell towers a person is connected to and when they are connected to it. Therefore, they know where you are generally and can guess where you live and work. They also know which websites you visit on all your mobile devices. For example, an operator might see that you visited the Best Buy website on Monday and then connected to a cell tower near a Best Buy store on Tuesday. The operator could conclude that you did research online before going to a physical store to make a purchase.

Mobile operators have access to an enormous amount of data, but right now, they're not putting it to much use. That won't last much longer.

Telefónica launched Dynamic Insights late last year. This is a project to aggregate data, make it anonymous, and sell it to advertisers. A video on Telefónica's web site says the group offers information about "actual consumer behavior instead of perceived behavior."

Project Oscar is a joint venture between O2, Vodafone, and EE UK. Late last year, it launched Weve, which took an aggregated approach to users and data.

This is a whole new revenue stream for operators, and in the UK at least, it seems to be a higher priority than mobile payments. It is also something that operators are willing to cooperate on (unlike NFC payments).

Before getting too concerned about

privacy and a dystopian future of Big Brother selling us Soylent Green, let's consider the sheer volume of data we're talking about. It's really big data. Think about the billions of people in the world with mobile phones and the fact that more of us are getting every day. Consider the number of text messages we send in aggregate. (Last year, it was nearly eight trillion.) Consider the number of cell towers each of us passes by each day. Every couple of minutes, there's a new location record for every phone in the world. Add to that calls, browsing, etc. and that is big, big data.

Big Data Risks and Challenges: Impact on People, Processes and Systems

Like all disruptive technologies, big data isn't without its risks. A recurring problem is that companies put the technology ahead of processes, people, and specific outcomes. They work forward from the technology instead of backwards from business outcomes. While many understand the value of information harnessed from a myriad of internal and external sources, fewer understand how to make that information accessible and actionable at the exact point where it can be used by knowledge workers across the organization. The challenges to leveraging big data for SMART business objectives are no different than other information-analysis methods and must start with a plan integrating people, processes, and technology. Such a plan must include the processes for identifying and capturing the data, and the tools to manage (access,

sync, merge, store, tag, and annotate) the data. It must also include the processes for the timely distribution of the data to the area where it can be applied for specific purposes and to achieve consistent results.

Another challenge with big data is relevancy. More data creates more noise. Business analysts need to classify data into a spectrum that ranges from noise to signals and base this spectrum, in large part, on the use case and weighted results of the data. Other challenges, such as data privacy, information security, information distribution, data presentation and even data overload, are not unique to big data, and risks and solutions can be learned from other business analytics solutions.

Conclusion

We have entered the era of big data, which is beginning to take center stage. Given this explosion of data, there is a dire need to glean useful business insights from it. Big-data analytics provides a way of gaining wisdom from otherwise useless data. Big-data analytics will be mission-critical in the enterprises of the future. There are some common challenges across a wide range of big-data applications, so it is not cost-effective to address the problems in one application alone. These challenges will require transformative solutions and will not be addressed naturally by the next generation of industrial products. We must support and encourage fundamental research on these technical challenges if we are to achieve the promised benefits of big data. **ZTE TECHNOLOGIES**

UniCare:

*Creating Superior
Customer Experience to
Help Operators Achieve
Unique Value*

By Wu Jiangtao

Emerging Reforms in the Telecom Industry

Growth in global telecoms is expected to drop below 3% in the coming three years. However, there are some particular areas where growth might reach 10% to 30%. These high-growth areas are broadband, cloud services, government-enterprise networks, IPTV, and PBX. OTT business accounts for less than 4% of total telecom revenue, but is strategically significant in the industry.



The telecom industry is undergoing a profound transformation, and operators are faced with various challenges. First, although competition among operators has driven down tariffs, operations are not efficient enough. Telecom operators are therefore seeking to outsource their non-critical services. Second, there are challenges in terms of rapidly evolving technology. While guaranteeing a healthy, stable network, a telecom operator must also keep up with these changes, which include the deployment of LTE and small cells and the rapid growth of the 100G Ethernet. As a result, telecom professional services have been urgently sought out. Third, operators are finding it hard to remain dominant in the mobile internet market, where their profits are falling. On the one hand, OTT companies and content providers are launching services that are constantly changing consumer attitudes and consumption

habits. This is significantly impacting the basic businesses of traditional operators. On the other hand, OTT companies and terminal manufacturers are gradually taking control of internet portals, including terminals, browsers, and online application stores, which are all important in attracting users away from the services of traditional operators. According to a survey, improving user experience is the top priority of 68% of operators because they realize that user experience is now critical to retaining and attracting users. Guaranteed user experience is the basis of squeezing more value from communication pipes.

UniCare: Responding to Industry Changes and Transformation

ZTE UniCare is a service that helps operators deal with

developments and trends in telecommunications. UniCare is universal; that is, it provides holistic, whole-process solutions that are differentiated, customized, and not duplicable. UniCare provides packaged, customer-oriented technical solutions, tools, and platforms. It is a package of solutions that are adaptable to an operator's needs at different stages in their network development. UniCare addresses two main concerns of telecom operators: operational guarantee and consultation. Operational guarantee means protecting network quality, service quality, and user experience in order to reduce operating costs and retain users. Operational consultation means providing consultation services for new services and platforms.

Unlike other ISP solutions, UniCare provides operational guarantee as

well as consultation, and its one-stop concept sets a trend of intensive services. With extensive experience in guaranteeing service quality and user experience, ZTE has developed UniCare, which is a holistic system for evaluating the quality of mainstream internet services. The system features ZTE's unique patented technologies and supporting platform and protects an operator's investment.

Guaranteed Network Efficiency

Fierce competition has urged telecom operators to provide quality networks and cut operating costs, and operators are increasingly turning to service providers for total solutions. A service solution should encompass all network devices, including third-party devices. ZTE's UniCare network performance management (NPM) solution is rooted at the network device layer so that it can solve problems with network stability and security and ensure high network performance. UniCare extends traditional network optimization services. It includes integrated third-party network optimization capabilities, and various maintenance scenarios such as major event guarantee, maintenance improvement, and new tools and

functions. It also includes professional support staff. UniCare NPM provides operators with layer-based, end-to-end solutions to ensure high network quality and low OAM costs.

Optimized User Experience

Operators need a service for monitoring, evaluating, and improving service quality and user experience. By doing this, an operator can solve the problem of declining user loyalty and meet user demand for better experience. UniCare service quality management (UniCare-SQM) and UniCare customer experience assurance (UniCare-CEA) solutions are now available. UniCare-SQM evaluates the quality of popular internet service, such as QQ and WeChat. It displays the quality level, and it locates and solves quality problems. UniCare-CEA uses ZTE's self-developed user experience evaluation system, optimization methods, and CEMC support platform to provide VIP experience monitoring and guarantee. It also provides VAP user mining and care and helps an operator build visible, manageable brand that provides good user experience and increases competitiveness.

Helping Operators Transform

Growing data services require higher network quality and bandwidth, and this requires more investment in network construction and maintenance. Unfortunately, operators are not generating more revenue in the post-PC era. UniCare

operation consulting (UniCare-OC) helps an operator streamline internal processes and analyze organizational architecture in order to transform from network-oriented operation to user experience-oriented operation. By devising a competitive tariff strategy and analyzing service packages, operators can identify market and service hotspots and uncover new revenue sources.

Future of UniCare

UniCare has served more than 200 operators around the world. Within a few months of release, UniCare-CEA was adopted by CSL in Hong Kong, TATA and Reliance in India, Telenor in Europe, Hutchison in Austria, and MTN in Nigeria.

In the future, UniCare will be developed more deeply in both horizontal and vertical directions. Horizontally, different networks (including 4G networks) will be able to better coordinate with each other so that operators can adapt faster to transformations and network reforms, cope with competition from mobile OTT providers and terminal manufacturers, increase pipe value, and create new models. Vertically, networks and service layers will be integrated for better user experience. This involves increasing network value from the top (user experience) down or guaranteeing network experience from the bottom (network layer) up. UniCare is working in these two modes to create a brighter future for operators. **ZTE TECHNOLOGIES**

By Zeng Zhi and Yang Yi

A 3G user receives an SMS from the customer care center one weekend morning. The message is about phone packages—get a free phone with certain amount of credit. In fact, the user's service subscription is about to expire, and they may be thinking of buying a new mobile phone and switching to another operator. Just hours ago, they browsed B2C websites over the 3G connection to check the price of mobile phones mentioned in the message and compare all available bundles. The message arrives just in time with an attractive offer. The user also remembers that 3G access in their apartment is slow and that a new phone could be a handy alternative way of using the internet. The user makes a short detour to the nearest telecom business hall.

Operators are feeling the pressure of churn because customers are eyeing up attractive bundles offered by competitors. If the customer doesn't have a good reason to stay, the competition will give them a good reason to leave. How can operators attract new customers and retain old ones in the fast-growing big-data era?

The Importance of a Customer Churn Prediction Model

Mobile operators focus their attention on bringing in new customers and exploring new business opportunities. Mature technologies and an increasingly saturated telecom market have led to fierce competition between operators. People are free to choose more cost-effective packages or better quality service. Customer churn is no longer rare for operators. It is less expensive to retain a current

customer than to find a new one. Statistically speaking, acquiring new customers can cost up to five times more than satisfying and retaining existing customers. In a mobile market with fewer and fewer incremental customers, lower churn means less cost and less revenue loss. Therefore, mobile operators have to be concerned about customer churn. Invigorating an existing customer base has become a hot topic. The most common ways of reducing customer churn are stored charges, free charges, and free phone packages. If operators can accurately predict in advance which users may leave, they are more likely to take early action to prevent churn and minimize losses.

Telecom managers seek to understand which customers may leave and when. A customer churn prediction model can help managers predict customer behavior by analyzing historical and current data, extracting key data for decision making, and discovering hidden relationships and patterns. Churn prediction models have been a hot research field in recent years.

Operators have spent a lot of time and effort creating and improving models and have achieved results. T-Mobile US has integrated multiple IT systems into a large data application. By combining mass customer history data and analyzing customer transactions and interactions, T-Mobile could extract the behavior of the customer before they switched to another operator. This helped T-Mobile accurately predict its customer churn. In the first quarter of 2011, T-Mobile halved its churn rate in the United States.

Deficiencies of Existing Churn-Prediction Models

An accurate churn-prediction model depends largely on the completeness, quantity, and quality of the available data. Factors such as brand, bandwidth, terminal, service, consumption behavior, tariff, convenience, change of workplace, and user experience can all be causes of customer churn. Operators can never get all the information about customers but can make assumptions based on the available information.



In this case, the decisions an operator may make might not be optimal (or even completely wrong). Therefore, an operator needs to make an effort to collect and integrate new data about customers from emerging contact points. This allows an operator to gain insight into the wants, preferences, and decision-making processes of their customers.

Certain events, behaviors, and environments can be identified as having bearing on customers prior to a churn event, and these factors can be predicted. For example, an operator might find that a customer's data traffic significantly drops every month in the lead up to the customer leaving. The number of monthly outgoing calls may decrease, and there may be records that the customer has made complaints to the service center. In this case, the customer is a high risk to leave. At present, most telecom companies are using customer, network, and service data extracted from business analyses, CRM, billing, and network management systems to establish a customer churn model. Such data include customer age, gender, occupation, type of terminal, call records, traffic, complaints, home region, geographical location, online time, date of churn, and payment information. Although analyzing this data allows an operator to predict customer churn to some extent, the real reason a customer leaves can never be fully known every time. A customer may have changed simply because the competitor has a better quality network.

Market research firm Synovate surveyed mobile phone users in more than 8000 cities in Ukraine, Russia, India, Indonesia and Argentina and found that on average 48% of users believed that network quality was the primary factor influencing their choice of operator. That is to say, a user is most likely to give up a network if they find that the call is not clear, network coverage is not wide enough, web pages are hard to open, or social media is slow to update. Therefore, the churn prediction model includes user experience as a criterion for accurately identifying these users. This can greatly increase customer retention.

Improving the Customer Churn Prediction Model with CDR and IPDR

The call detail record (CDR) and internet protocol detail record (IPDR) are important data sources for quantifying and analyzing user experience and behavior. However, because of technical complexity and lack of related technical standards, CDR and IPDR data have not yet been widely used by operators for customer churn prediction.

CDR and IPDR data can be used in various applications as a new type of data source. From the data, operators can determine to whom calls are being made, how often calls are being made, where the user is located, how good the signal is, how long the service is used, what web pages the user has browsed, what mobile internet applications the user has used, how often applications are used, and how good application performance

is. These new data sources are very beneficial for information analysis. When new data is input into the churn-prediction model, user experience features are sorted using deep data mining, and an operator can understand relationships between factors prior to a churn event. With such knowledge, an operator can then determine whether network quality was an issue leading up to the loss of the customer and determine how the network can be optimized to retain customers in the future.

ZTE is an expert at managing user experience and has unique insight into CDR and IPDR data analysis. ZTE's UniCare technical service solutions provide operators with complete, custom-made, end-to-end CEA user experience guarantee and OC operational consulting services. These solutions help operators rapidly improve network performance and address customer churn issues.

Conclusion

In the big-data era of mobile internet, there has been an explosion of new and powerful data sources, and telecom operators are striving to remain competitive. CDR and IPDR data sources show promise in the customer churn management field. Operators need to invest more on building optimal churn-prediction models centered on customer experience. With these models, operators can make better customer churn predictions, implement more accurate customer retention programs, and ensure revenue is not lost. **ZTE TECHNOLOGIES**

ZTE's *UniCare* User Experience Assurance System

By Yang Yi and Zeng Zhi



Every network operator is concerned about user experience, but there is no standard for it. User experience can be improved by eliminating faults or increasing network coverage. However, these event-triggered approaches to improving user experience have many drawbacks. Problems are only solved after the negative effect occurs and user satisfaction declines. Also, potential problems that may affect user experience cannot be identified and solved. User requirements and network problems vary widely; therefore, a range of appropriate methods are

required to precisely evaluate user experience, determine factors that may affect user experience, and promptly improve user experience.

Network KPI

Operators mainly focus on network KPIs, such as statistical indicators including call completion ratio, dropped-call rate, handover success rate, congestion rate, resource load, and paging success rate as well as measurement indicators, such as signal level, receiving power, signal quality, per-mile dropped-call rate, and MOS.

Statistical indicators reflect system

equipment capabilities, functions, resources, and performance. They also reflect pipeline access performance, sustainability, and pipeline quality. In term of troubleshooting, statistical indicators are irreplaceable. However, statistical indicators cannot reflect the experience of a specific user of a specific service. Therefore, statistical indicators are not ideal for properly evaluating user experience.

Measurement indicators are used to test and record common services through road tests and spot tests. They are used to evaluate user experience on main roads and in important areas. Because measurement indicators contain accurate position information, they are irreplaceable for evaluating user experience in high-speed rail, along highways, in subways, and on main roads. However, measurement indicators also have drawbacks. First, road tests and spot tests require a lot of investment. Second, because of user mobility and randomness, road tests and spot tests cannot be carried out across all areas. Roads and transport services are constantly being tested and optimized in important areas and the quality of transport networks in these areas is rather high. The factors that negatively affect user experience are in those other areas that are not subject to such rigorous testing and optimization.

UniCare is integrated with network and pipeline KPIs to form a matrix that supports multi-network collaboration to identify, locate and solve problems.

Therefore, measurement indicators do not comprehensively reflect user experience over the whole network.

User Behavior Study

User behavior study is essential for an accurate, comprehensive evaluation of user experience. An office worker may get up at seven in the morning, read internet news and blogs at breakfast or while commuting, make IP calls and send/receive messages at work, and in the evening, browse the internet, watch online videos, or read blogs. The office worker is continually engaging the network throughout the day, and a less-than-ideal network experience is likely to make the worker dissatisfied with the operator. However, the behavior of an individual may not be indicative of the broader concerns and experiences of users across the network. Network-wide user behavior modeling and analysis and user experience evaluation are required to gauge the concerns and experience of all users. The experiences of users in the same area may be similar, and the experiences of users in different areas may differ slightly. Therefore, user behavior models, data acquisition schemes, and user experience criteria

need to be developed for rural areas, urban areas, or even schools.

ZTE's user experience evaluation system uses different user behavior models, data acquisition schemes, and user experience standards for typical areas. Common services are identified, and a KQI is specified for a specific service. The evaluation

system determines the QoE by using a normalization algorithm based on the KQI, and provides an independent experience evaluation for each user. This evaluation system can perform association analysis on multiple networks to track users of any service and determine past or present QoS for those users.

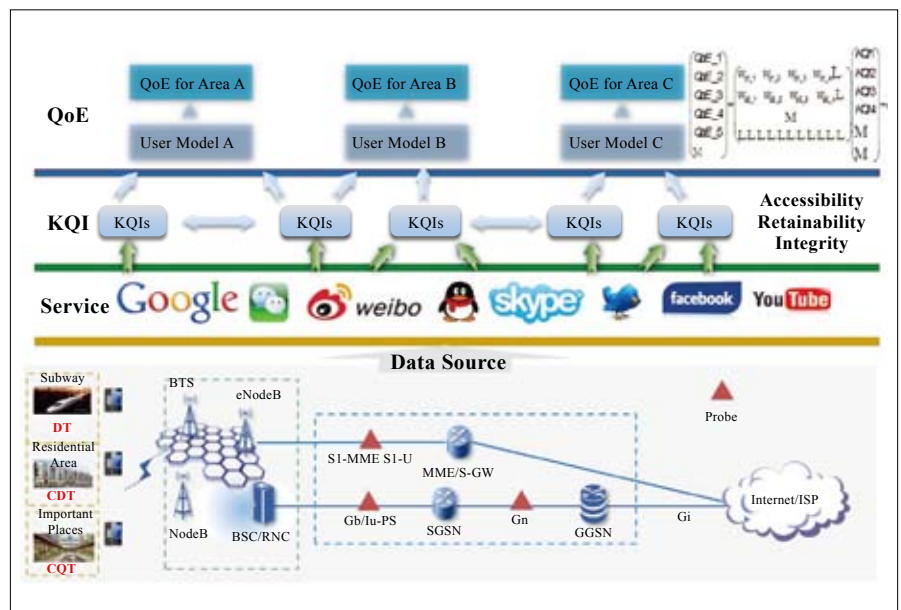


Figure 1. ZTE's user experience evaluation system.

Matrix User Experience Assurance System

ZTE's comprehensive, accurate user experience evaluation system is called UniCare. It is integrated with network and pipeline KPIs to form a matrix that supports multi-network collaboration to identify, locate and solve problems.

UniCare comprises a QoE evaluation system and a network and pipeline KPI system.

The QoE evaluation system captures and analyzes packets on interfaces such as air interfaces, A/Iu-CS/, Gb/Iu-PS/RP, Gn, and Gi/Pi. It then extracts and filters indicators. Through association and interconnection, the system combines user behavior models and measurement methods in different areas to provide a comprehensive, accurate user experience evaluation.

The network and pipeline KPI system normalizes indicator systems based on capability, function, resource, and performance indicators. Capability indicators indicate the basic capabilities of a device. They are the foundation of user experience assurance and indicate the maximum capacity, sensitivity, and maximum throughput of a device. Function indicators indicate device features that can improve network performance. These features may be distance-based paging, interference suppression, signaling storm suppression, or dynamic AMR. Resource indicators

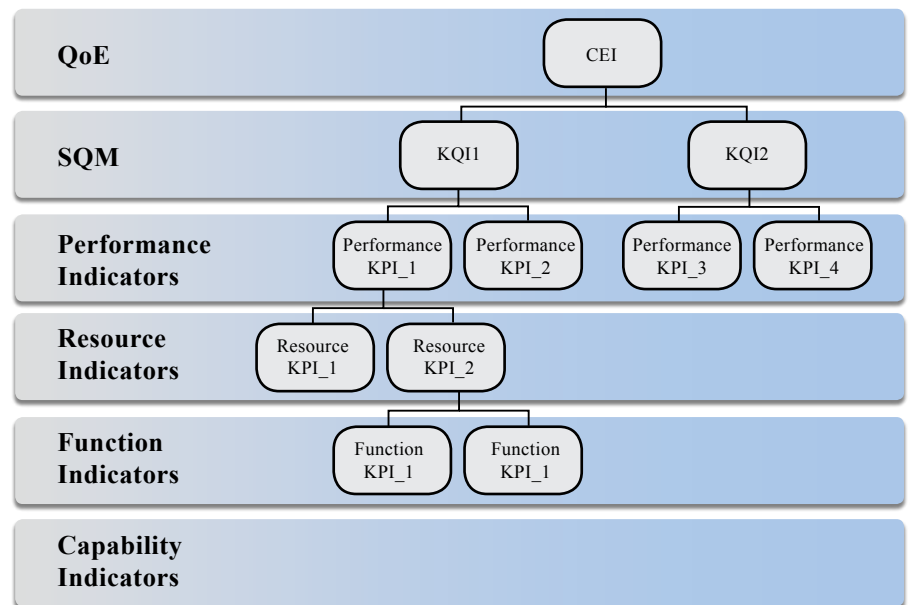


Figure 2. ZTE's matrix user experience assurance system.

indicate the network load, which is the main factor affecting user experience. Resource indicators indicate channel slot, code resource, CPU, and transmission resource utilization. Performance indicators indicate network performance, which is another important factor affecting user experience. Performance indicators indicate handover success rate, reverse interference, packet loss rate, receiving level, and signal quality.

Summary

Users are rarely concerned about the

technicalities of network performance. The only thing that matters to them is their experience in using services. People in different areas tend to use slightly different services and have different expectations. Therefore, operators need to develop an indicator system that can evaluate diverse user experiences across the whole network. Then, they need to improve user experience gradually so that user experience is assured over the long term. ZTE's UniCare solution helps operators guarantee and manage user experience of every user. **ZTE TECHNOLOGIES**

Optimizing PTN for LTE

By Yang Benmin

A packet transport network (PTN) has uniform interfaces and makes efficient use of bandwidth. For this reason, it has replaced multiservice transport platform (MSTP) as the main bearer network for mobile backhaul. Although PTNs are developing quickly, they are still prone to resource bottlenecks and security risks. Moreover, dynamic traffic channels and high network self-management requirements have made it difficult to guarantee bandwidth and maintain the network.

ZTE UniCare is a solution for optimizing PTNs so that they are reliable, easy-to-maintain, and provide sufficient bandwidth. ZTE UniCare uses quantitative network indicators to thoroughly assess network resource bottlenecks, security issues, and future LTE bearer needs.

Leveraging Existing PTN Resources for Fast LTE Deployment

More bearer devices are needed to support an LTE network. LTE base stations provide less coverage than 3G base stations yet require 10 times the bandwidth. As more operators look to deploy LTE, PTN planning needs to become more rational and efficient so that an

operator's existing PTN capacity is fully exploited. This helps improve return on investment. ZTE uses professional network optimization tools to comprehensively assess a PTN and leverage existing network resources so that an LTE network can be deployed quickly.

ZTE exploits existing PTN resources in the following ways:

- L3 VPNs of devices at the core convergence layer are upgraded for large-scale LTE service bearing and flexible traffic scheduling.
- The access ring is split and optimized to meet the bandwidth requirements of an LTE network.
- The links in hotspots are upgraded to meet access needs of a large volume of traffic.

QoS for Optimized Network Operation

An LTE network is more demanding in terms of reduced packet loss, delay, and jitter and increased bandwidth. However, satisfying these demands does not necessarily increase ARPU.

A high-yielding network is characterized by a large user base, high profit margin, and strictly controlled costs. In the LTE era, operators focus on reducing

delay, packet loss, and jitter and guaranteeing bandwidth because this is fundamentally what increases the user base.

ZTE's QoS optimization solution is designed to protect an operator's initial investment in their PTN. Priority scheduling, congestion control, and speed limitation are used to optimize bandwidth utilization, meet different user needs for bandwidth, and ensure that SLAs are honored. Operators can optimize the way their network operates in a high-bandwidth LTE environment.

A Highly Reliable Network for Smooth Evolution to LTE

As competition heats up, user experience is key to retaining existing subscribers and attracting new ones. It is also key to maintaining the brand image of an operator. One of the answers to improving user experience is network reliability.





Efficient OAM for Improved Competitiveness

A large-scale LTE network based on PTN is difficult to maintain. Operators are therefore concerned about making OAM more efficient, reducing the need for manpower, and lowering maintenance costs. A PTN is highly flexible and self-manageable. Maintaining such a dynamic network is much more difficult than maintaining a previous-generation MSTP network.

ZTE's PTN OAM solution has automatic, intelligent tools for fixing faulty services, optimizing configuration procedures, enhancing network performance, and optimizing

upgrade and control procedures. It improves labor efficiency and ensures reliability. It also helps operators make PTN traffic visible and manageable.

Conclusion

3G networks are having difficulty meeting surging traffic demand created by mobile broadband services. Operators are left with no choice but to quickly evolve to LTE and scramble for a larger share of the mobile communications market. ZTE's optimized PTN bearer network solution for LTE is designed to exploits existing network resources. This allows for smooth evolution to PTN-based LTE as well as customized QoS, improved network security, and efficient OAM. **ZTE TECHNOLOGIES**

ZTE's PTN security-optimization service provides umbrella protection, from core to aggregation and access layers. ZTE uses a comprehensive security index system encompassing topology, node devices, and services in order to provide LAG protection, MSP protection, TPS protection, chain-to-ring transformation, dual-node transformation, active and standby bridge points, and pseudo-wire dual homing.

A man in a dark suit and red tie is pointing at a display of multiple screens. The screens show various IPTV content, including a large screen with a red background and a sun-like graphic, a laptop screen with a video player, and a tablet screen with a red background and a video player. The man is smiling and looking at the screens.

Mtel

Delivering Commercial IPTV Triple Screen Services

By Cheng Shenliang

Mtel is the biggest mobile operator in Bulgaria and is a wholly owned subsidiary of Telekom Austria Group (TAG). Mtel boasts millions of mobile subscribers but is working to expand the fixed network market and is binding mobile subscribers with fixed-network services. ZTE is well placed to help Mtel in develop its broadband user base.

ZTE has researched user behavior in Bulgaria and has introduced multiscreen integrated IPTV. This service allows subscribers to access the IPTV network through PCs, TVs, mobile phones and tablets. Customers can enjoy live TV,

video-on-demand, reserved video recording, and OTT applications.

Mtel and ZTE trialed IPTV in September 2011 and signed a five-year cooperation agreement later that year. According to the agreement, ZTE would provide Mtel with customized end-to-end solutions, including IPTV middleware, digital rights management, a content delivery network, and set-top boxes. The scale of the network was expanded over several phases.

On February 12, 2013, Mtel showcased triple screen IPTV in a commercial launch and press conference in Bulgaria. This service allows mobile

phones and tablets to access the IPTV system and supports broadcasting on a local triple screen client. The terminals can also share data and interact with a traditional STB. This is triple IPTV integration in its purest sense.

Professional Technical Solution

Mtel's network previously used VBR encoding for channel streams that had large bit-rate fluctuations, i.e. 20 Mbit/s at the peak. Such fluctuations exceed the processing capacity of the STB and seriously affect channel broadcasting. ZTE worked out a number of technical solutions for Mtel:

- CDN smoothly handles VBR streams, and STBs optimize UDP data processing to adapt to highly fluctuating VBR sources.
- Unicast FCC is used to improve the speed of switching unicast channels

and enhance user experience.

- Fragment broadcast technology allows for time-shift broadcasting in the event of discontinuous recording caused by interruptible streams.
- N+1 MDU backup increases the capacity of CDN nodes, and additional hardware investment is not needed.
- IQAS is used to monitor the system in real time and improve user experience.
- A security fortress is used to protect system security.

Swift Response

In January 2012, ZTE formed the Bulgaria Mtel IPTV commercial project team and started researching IPTV triple-screen service. In March, ZTE provided the first test version of the service. In April, Mtel Bulgaria put

basic IPTV services into commercial operation. At the end of July, an optimized version of the service was released. In August, Mtel officially launched an IPTV triple-screen system. In September, a version for iOS and Android terminals was released. In November, Mtel commercially trialed the triple-screen service. In February 2013, the IPTV triple-screen service was officially commercialized in Bulgaria.

Efficient Customization

During implementation, ZTE leveraged its advantage of rapid customization to ensure Mtel could commercially launch IPTV on time. Mtel demanded single sign-on (SSO) on its existing network, so ZTE started working on the technology immediately and customized the logon process so that the IPTV system could seamlessly connect to Mtel's existing system. The IPTV triple-screen system also needed to support a variety of mobile phone and tablet models. To meet this requirement, ZTE worked within a tight schedule to adapt its IPTV system to all software and hardware specified by Mtel.

Stable Subscriber Growth

With the commercial launch of the ZTE IPTV multiscreen integration platform, Mtel will provide richer content, better service packages, and better video experience in order to attract more users. The number of user registering to use Mtel's IPTV has been growing steadily. The user base reached 47,355 in April 1, 2013. According to the average growth rate of 5000 subscribers per month, Mtel will have 60,000 new users by the end of 2013. **ZTE TECHNOLOGIES**



Mtel's launch of triple screen IPTV (L to R: Andreas Elsner, marketing director, Mtel; Boyan Georgiev, associate general manager, ZTE Bulgaria; and Alex Stock, CTO of Mtel Fixed Network)

Jazztel

Leading FTTH Development in Spain

By Wang Hong

In Spain, demand for broadband services is soaring. Although telecommunications in Europe is developing quickly, Spain still lags in fixed broadband. Statistics for 2011 revealed that broadband penetration in Spain was 60%, which is the 5th lowest in Europe. To address this issue, Spain began a massive FTTX rollout in 2012.

Advancing Against the Headwind

Jazztel is the shortened name of Jazz Telecommunications, the fourth largest fixed broadband provider in Spain. The company was founded in 1998 and is owned by the British company Jazztel Plc. Jazztel offers triple-play (internet, telephone, and TV) and MVNO services.

With 1.3 million xDSL users, Jazztel aims to become the second biggest fixed broadband provider in the country.

Over the past three years, Jazztel has bucked the economic slowdown in EU with annual growth in user base and revenue of 20%. This makes Jazztel one of the fast-growing telecom operators in the EU. In 2012, Jazztel and Telefonica signed an agreement allowing each other access to their infrastructure and for jointly building FTTH networks. This agreement marks the start of Jazztel's FTTH construction. In November 2012, Jazztel partnered with ZTE to build a GPON-based FTTH optical access network that will be competitive over the long term.

Building a High-Speed FTTH Access Platform

Cost is the primary consideration in FTTH deployment. Operators reduce



“We are pleased to carry out this strategic cooperation with ZTE in building our national high-speed broadband FTTH network which will allow more users to enjoy the best of fiber network services in Spain,” said Jose Miguel Garcia Fernandez, chief executive officer of Jazztel. “We will continue to drive profitable growth and shareholder value going forward.”

investment by reusing existing twisted pair resources as much as possible. Some operators even opt for compromise solutions, such as FTTB/FTTC. Fiber is first installed to the curb, building or zone, and users are provided with 8–50 Mbps access bandwidth via VDSL2 and vectoring technologies. Such a network is not necessarily the cheapest. If the rate of service provisioning does not reach a certain level, the network costs even more than an FTTH network. Network analysis shows that the cost of end-to-end FTTH deployment declines drastically when the network reaches a certain size.

Network analysis and fierce competition have prompted Jazztel to choose FTTH. With a cutting-edge, scalable, high-speed access network based on FTTH, Jazztel hopes to remove bottlenecks to business development, boost competitiveness, and propel itself to No. 2 in the Spanish telecom market.

ZTE provided Jazztel with a turnkey solution that covers equipment, engineering, construction, and maintenance. To make the network future-

proof and scalable, ZTE provided an integrated, next-generation, full-service optical access platform called ZXA10 C300. This platform allows for smooth evolution to NG PON and WDM PON.

Each of the GPON boards has 16 ports, which is the highest port density in the industry. This not only satisfies Jazztel’s requirements for high-density PON ports but also saves equipment room. Equipment power consumption and network TCO are also significantly reduced.

ZTE also provided an ONT + home gateway networking solution that allows access to diverse services, including high-speed internet, voice and video. This solution meets Jazztel’s long-term service and bandwidth needs.

Fast Delivery, Efficient Deployment

ZTE’s state-of-the-art solution included superior delivery and exemplary service. After the contract had been signed, ZTE shipped 150 GPON OLTs in three months. To ensure the project was delivered on time and without

compromising quality, ZTE trained local engineering subcontractors one month in advance. In addition, ZTE developed service control measures and in-process quality control tools.

In less than two months, ZTE had deployed the first stage of the project and had put more than 70 OLTs into service.

Collaborating for a Bright Future

In the next three years, Jazztel’s FTTH network will deliver high-speed optical broadband services to three million home and enterprise users. “We are pleased to carry out this strategic cooperation with ZTE in building our national high-speed broadband FTTH network which will allow more users to enjoy the best of fiber network services in Spain,” said Jose Miguel Garcia Fernandez, chief executive officer of Jazztel. “We will continue to drive profitable growth and shareholder value going forward.” Jazztel’s FTTH network will increase broadband penetration in Spain and help Jazztel lead FTTH development in Europe. **ZTE TECHNOLOGIES**

Future SDN-based Data Center Network

By Huang Sunliang

Internet data centers are growing fast as the internet expands. As more processing is done at the cloud end, cloud data centers are also growing fast. Internet giants such as Google, Microsoft, and Tencent each have more than 100,000 physical servers in their cloud data centers. In the future, internet traffic will be located within the cloud data center.

Challenges Facing the Data Center Network

As data centers expand fast and cloud computing is deployed widely, new requirements are being put on the data center network in terms of network management, service support, and energy efficiency.

Centralized, efficient network management

A large-scale cloud computing data center generally comprises tens of thousands of physical servers and hundreds of thousands of virtual machines (VMs). Such big server clusters require thousands of physical network devices and tens of thousands of vSwitch devices for interconnection. A large-scale data center network requires centralized management for efficient maintenance, and it also requires fast troubleshooting to improve network usability.

Flexible, efficient networking

Redundant links, protection links,

and other proper protection mechanisms should be considered in the design of a complex, large-scale, cloud computing data center network. These guarantee network flexibility and reliability. Virtual Router Redundancy Protocol (VRRP) and Double-Link Upward Connection and Spanning Tree Protocol (SPT), which are both widely used in data center networking, only protect part of the network. This makes the network underutilized and vulnerable.

VM deployment and migration

A cloud data center is deployed with a large number of VMs that need to be flexibly migrated according to service needs. The data center network therefore needs to be able to identify VMs and adopt appropriate network policy according to VM deployment and migration.

Service support for multiple virtual tenants

The cloud data center should provide users with virtual private cloud leasing. Tenants can configure their own subnet, VM IP address and access control list (ACL), and they can also manage their own network resources. The data center network needs to support multiple virtual tenants and guarantee tenant isolation and security.

All-round IaaS

Cloud technology helps the data

center virtualize computing and storage resources and therefore provides users with IaaS concerned with computing and storage resources. Network resources are yet to be provided virtually on demand; that is, all-round IaaS, including computing, storage and network resources, is still unavailable.

Current Technologies of the Cloud Computing Data Center Network

Some technical solutions have been proposed to address the challenges faced by the cloud computing center.

Trill and SPB

Transparent interconnection of lots of links (Trill) and shortest path bridging (SPB) were designed to meet the demands of multipath forwarding and flexible data center deployment. They solve the problems of decreased link utilization ratio and degraded network stability created by shortest path tree (SPT) deployment. They also solve other complicated problems caused by layer-3 routing in the data center.

Trill and SPB allow for loop-free link counting based on the IS-IS protocol. They use equal-cost multipath technology for multipath forwarding with balanced loads. This increases the network utilization ratio and reliability of the data center network and makes network deployment more flexible. However, neither Trill nor SPB solve problems

related to centralized management, VM deployment and migration, and IaaS provisioning in a data center network.

EVB

Edge virtual bridging (EVB), defined by IEEE802.1Qbg, includes the edge relay, virtual edge bridge, and virtual edge port aggregator. EVB identifies and bears multiple VMs. It uses the VDP protocol for dynamic VM creation and migration discovery, and it automatically configures relevant network parameters to meet the needs of dynamic VM migration. However, EVB also does not solve problems related to centralized management, multipath forwarding, virtual multitenant, and IaaS.

VXLAN

Virtual extensible LAN (VXLAN) addresses virtual multitenant and VM migration issues in the data center. VXLAN uses the L2 over L3 technology to add VXLAN and IP encapsulations to the original packet encapsulation. In this way, the original L2 packet can pass through the L3 network, the scope of the L2 network can be expanded, and the VM migration can occur flexibly across L3. VXLAN encapsulation greatly expands the tenant ID field and overcomes the 4K capacity limitation of the VLAN mode. However, VXLAN does not solve problems related to centralized network management, data center, and IaaS.

NVGRE

Network virtualization using generic routing encapsulation (NVGRE) is also designed to address the issues of virtual multitenant and VM migration in the data center. NVGRE also uses the L2 over L3 technology; however, unlike

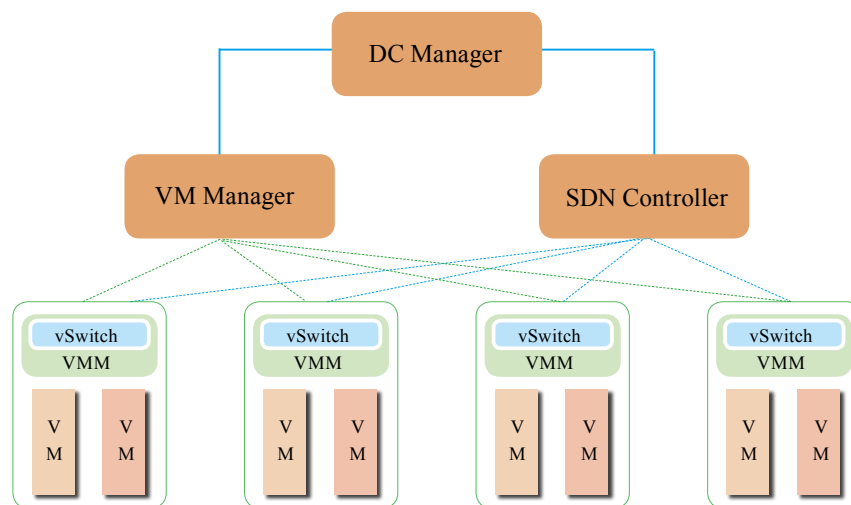


Figure 1. ZTE's SDN-based data center network solution.

VXLAN, it uses GRE encapsulation and supports multiple virtual tenants by matching the tenant ID with the GRE tunnel. Centralized network management and IaaS issues are not taken into consideration either.

At present, the main data center networking technologies are only designed to tackle specific demands within a data center. They only solve some of the problems of a data center network.

Data Center Networking Solution based on SDN

A software-defined network (SDN) has forwarding and control, centralized control logic, network virtualization, and open network capabilities. This fits well with the requirements of a data center network in terms of centralized network management, flexible networking and multipath forwarding, VM deployment and intelligent migration, virtual multitenant, and IaaS. Cloud data center

networks based on SDN is a future trend.

A data center network solution based on SDN comprises the SDN controller, VM manager, and DC manager. The SDN controller controls and manages network devices, including the vSwitch that resides in the server. The VM manager is responsible for VM creation, deployment, and migration. The DC manager is responsible for overall control and coordination of computing, storage and network resources, i.e. mainly the coordination between the VM manager and SDN controller.

Centralized and efficient network management and maintenance

SDN has separate forwarding and control as well as centralized control logic. The SDN controller stores static topology and dynamic forwarding information about the whole network so that the network can be efficiently managed and optimized. This, in turn, helps network troubleshooting. With static topology and

■ Solution



dynamic forwarding information about the whole network, dedicated fault diagnosis tools can be developed to simulate the actual forwarding process. This is useful for locating and handling faults quickly.

Flexible networking and multipath forwarding

In a data center network based on SDN, the forwarding rules and actions are controlled and delivered by the SDN controller, which asserts control through the forwarding flow table and according to service needs. This prevents loops and ensures multipath forwarding and balanced load so that network reliability and usability are greatly improved.

Intelligent VM deployment and migration

VM deployment and migration require network coordination. In a data center network solution based on SDN, the DC manager, VM manager and SDN controller work together to support intelligent VM deployment

and migration. When a VM needs to be migrated, the VM manager senses the need first and then sends out a network coordination request to the DC manager. The DC manager receives the request and then sends a coordination request to the SDN controller. The SDN controller issues a proper network strategy to the destination network device and abolishes the original network strategy of the network device where the VM used to reside. In this way, coordination between the VM and network is seamless, and the VM is migrated automatically and intelligently.

Support for a large number of virtual tenants

To bear a large number of tenants, ZTE's data center network solution based on SDN identifies tenants using current MPLS labels. The 20-bit MPLS label supports an extremely large number of tenants. The SDN controller can separate tenants so that every tenant has a virtual

network view, resource control, and guaranteed security.

**IaaS with coordinated computing,
storage and network resources**

With the help of the SDN controller, network resources can be virtualized and provided on demand. The DC manager helps coordinate the SDN controller and VM manager so that coordination between computing, storage, and network resources is seamless. Users can receive IaaS on demand.

ZTE's solution based on SDN helps in the deployment and operation of a large data center. SDN technology is still developing, and there are still some issues to be addressed. It is critically important to achieve seamless interworking between the DC manager, SDN controller, and VM manager provided by different vendors. Evolving from an existing data center network to a data center network based on SDN is a challenge in terms of network deployment, and technological changes and SDN trends require continuous attention.

Conclusion

Many solutions have been proposed to address issues with data centers. Interfaces for coordination between the DC manager, SDN controller, and VM manager should be standardized, and network devices that support multiple forwarding modes should be deployed so that the existing forwarding mode and SDN-based forwarding mode can function. SDN technology and architecture need to be continually monitored and appraised, and international standards need to be developed to ensure the continuity in the SDN architecture and compatibility with different SDN versions.

In the future, the data center based on SDN will develop vigorously and will push forward the development of the internet and applications.

ZTE Aims at Bigger Share in Neighbors

October 5, 2013

By Shen Jingting

Source: China Daily



million smartphones this year.

In Malaysia, ZTE is one of the main suppliers to TM for the broadband network, and ZTE is also major supplier to DIGI, UMOBILE and P1 for the cellular network. Recently ZTE rolled out the commercial LTE network for DIGI, and very soon will help Umobile launch the LTE commercial network.

Fred Zhang, managing director of ZTE Malaysia Corp, said the biggest opportunity for the company in Malaysia is that the nation is in a new period of 4G wireless network construction. "For ZTE, we not only help our telecom carrier clients to deploy network infrastructure, but also we want to provide them with in-depth applications based on 4G network," he said.

"By cooperating with local government and enterprises, we hope to help build Malaysia as a regional hub for cloud services and data centers."

ZTE said it highly valued the importance of creating jobs and strengthening localization in both Indonesia and Malaysia. ZTE now has around 500 employees in Indonesia, of which 60 percent are local hires. **ZTE TECHNOLOGIES**

ZTE Corp, the world's fifth-largest telecom equipment and smartphone manufacturer, has steadily increased its footprint in Indonesia and Malaysia, and hopes to achieve greater success in the countries in the near future.

Since ZTE's pioneering employees began exploring the Indonesian market in the late 1990s, PT ZTE Indonesia has grown into one of ZTE's largest overseas subsidiaries, with a competitive staff, complete organizational structure and significant turnover.

But to achieve this accomplishment was by no means an easy task. At the beginning, ZTE had difficulty breaking into the local market. The situation improved significantly between 2006 and 2007, as the company achieved \$200 million in annual sales in 2006 and doubled its revenue the following year.

Mei Zhonghua, president director of PT ZTE Indonesia, said the company now has a clear focus in Indonesia on three major fields—the telecom

carrier market, the terminal market and enterprise ICT solutions.

PT ZTE Indonesia has so far established close cooperation with major operators in Indonesia, including PT Indosat, PT Telkom and PT Telkomsel. Between 2010 and 2012, ZTE was the sole equipment supplier to PT Telkom's FTTH project.

Meanwhile, ZTE has made a significant breakthrough in the mobile terminal market in Indonesia. "We expect to sell more than 200,000 smartphones in the country this year," Mei said in a telephone interview.

He forecast that ZTE would achieve an annual growth rate of 50 percent in terms of smartphone sales in Indonesia in the next couple of years.

Globally, ZTE shipped 10.1 million smartphones, 4.2 percent of world's smartphone market, in the second quarter of this year, according to an IDC report. The Shenzhen-based cell phone vendor was the fifth-largest smartphone company worldwide, behind Samsung Electronics, Apple Inc, LG Corp and Lenovo Group. ZTE aims to ship 50

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